Collecting Today, Saving For Tomorrow: A Proposal for Rainwater Cisterns

Created by: Regina Fletcher, Colin Campbell and Kyle Clifford

Climate Change Impacts

- Temperature increase
- Earlier snowpack melt = Less summer flow
- Less summer flow = Local watershed stress
- More stress = high costs and less irrigation water

Aerial View of Lake Whatcom Watershed

Problem

- Large impact on Whatcom County's natural resources and local utilities
- Increase in water costs

Solution

- Build two 5,100 gal. cisterns to collect rainwater from the roof of Carver Gym
- Conserve water sustainably/lessen dependency on Lake Whatcom

Quick Knowledge

Potential Non-Potable Water Uses

- Non consumable
- Flushing toilets
- Wash equipment
- Irrigation

Why is Rainwater Better?

Potable Water

- Requires energy to disinfect, treat, and transport water
- Water utility rate is increasing
- Availability of local water sources decreasing

V. Rainwater

- Currently available natural resource
- Can be sustainably used on campus
- Reduces stormwater runoff
- Saves money on water bill!!

Rules and Regulations

RCW 90.03

- "The on-site storage and/or beneficial use of rooftop or guzzler collected rainwater is not subject to the permit process."
- Rainwater collection is **not** illegal in WA State
- State actively encourages rainwater collection

Case Study

Georgia Tech

- 6,000 gallon tank
- 30% irrigation cost reduction

Local Case Studies

Seattle Public Library

•Includes a 40,000 gallon underground tank with drip system

Seattle City Hall

•Includes a 210,000 gallon underground tank

•88% water reduction

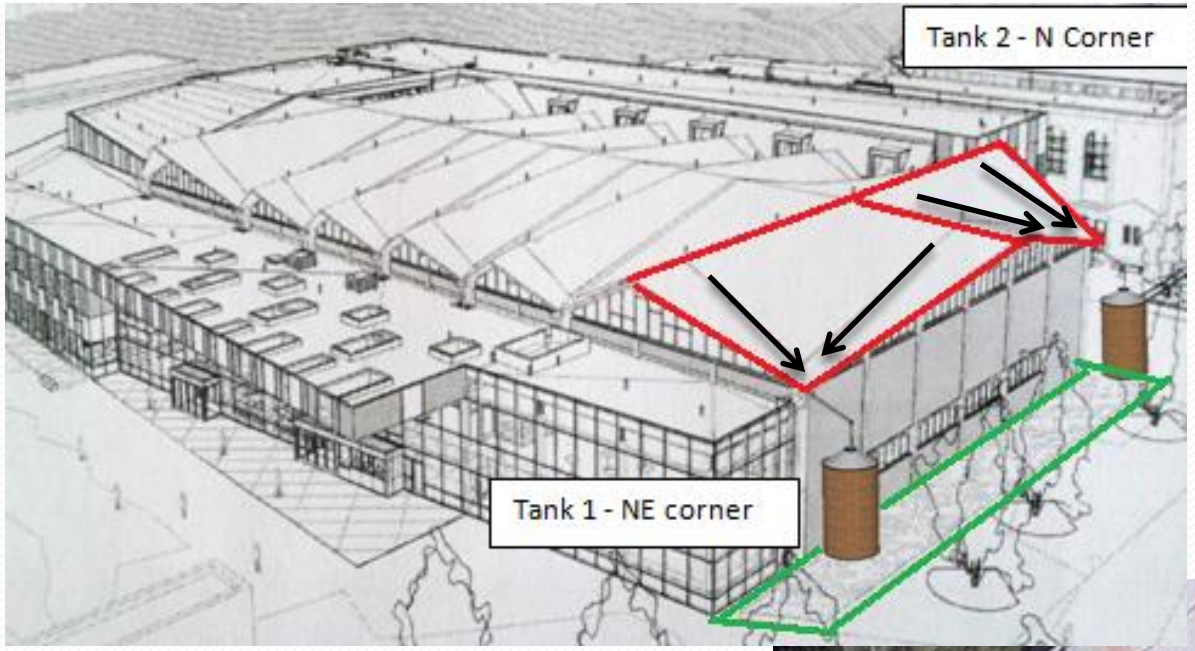
Rainwater Cistern Pilot Project

Educational Value

1,000 gallon tank near Biology greenhouse

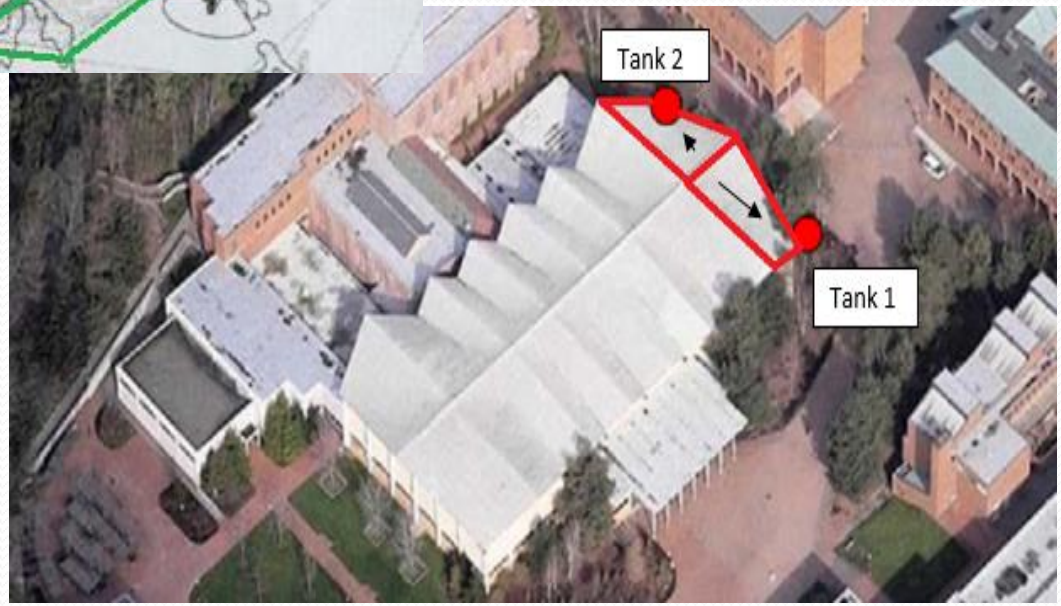
- Water Gauge
- Electronic Meter
- Information Plaque
- Class Involvement

Location

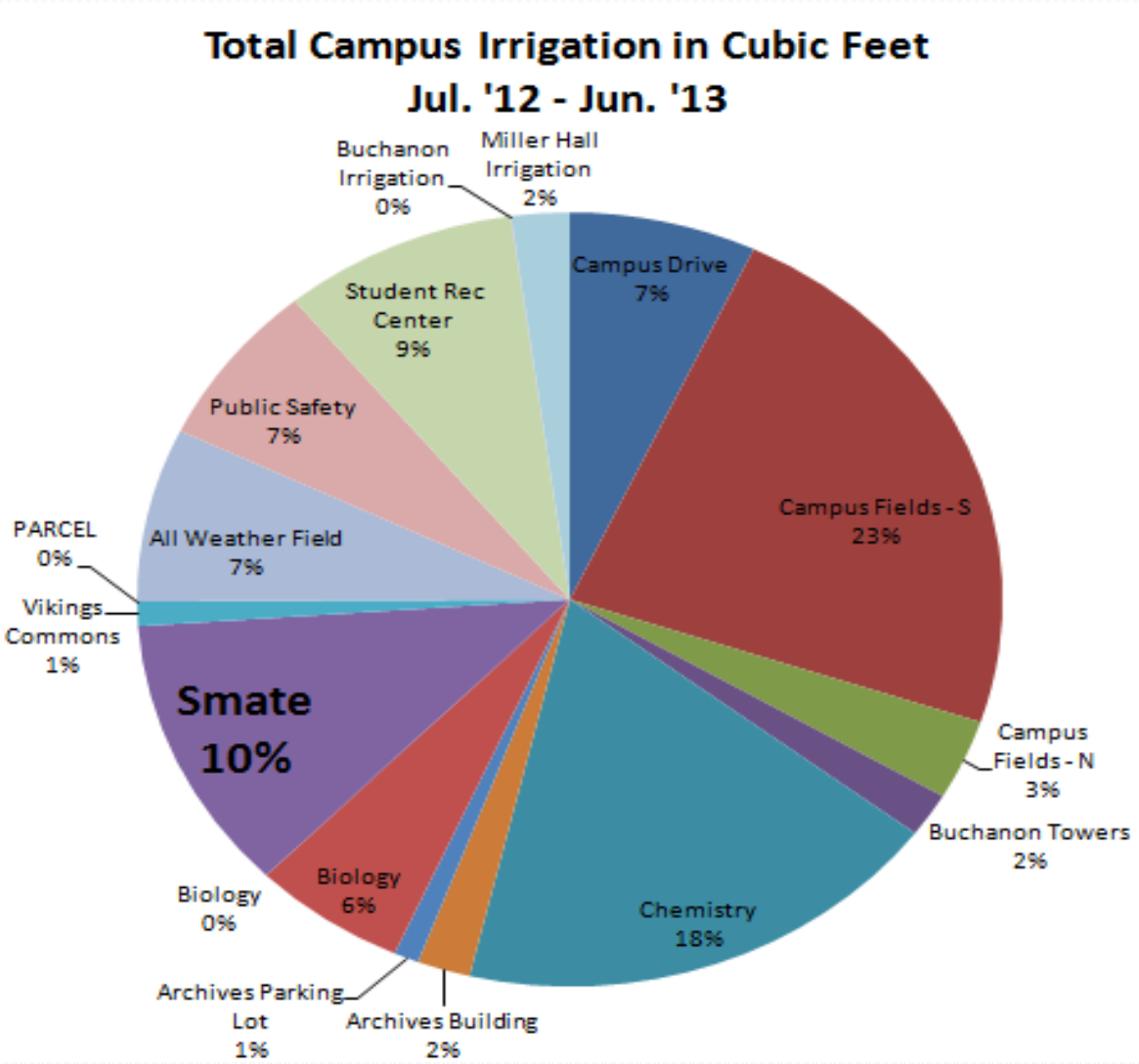


Green square = 3,800 Sq. Ft. of bed space

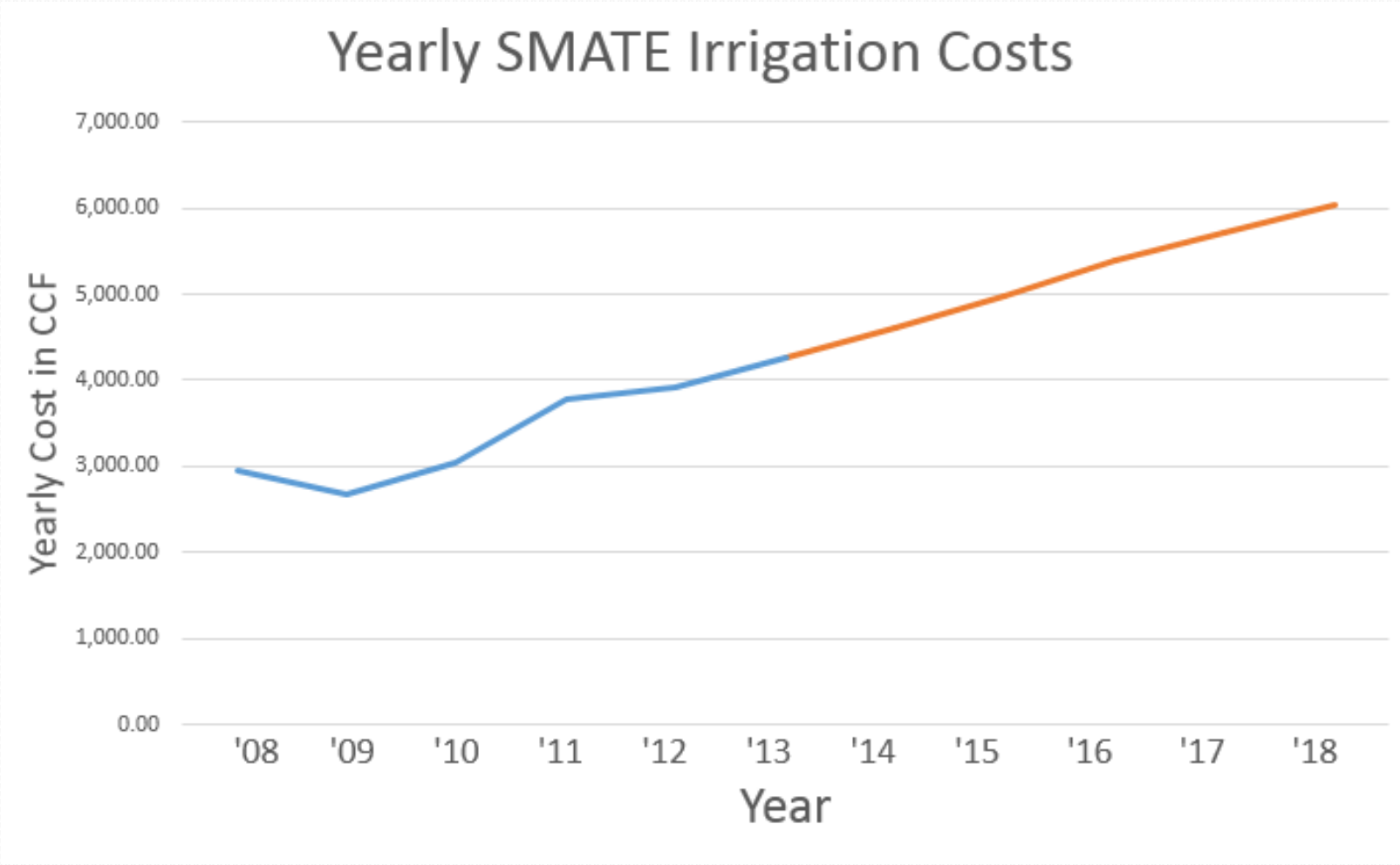
Roof size = 4,900 Sq. Ft.

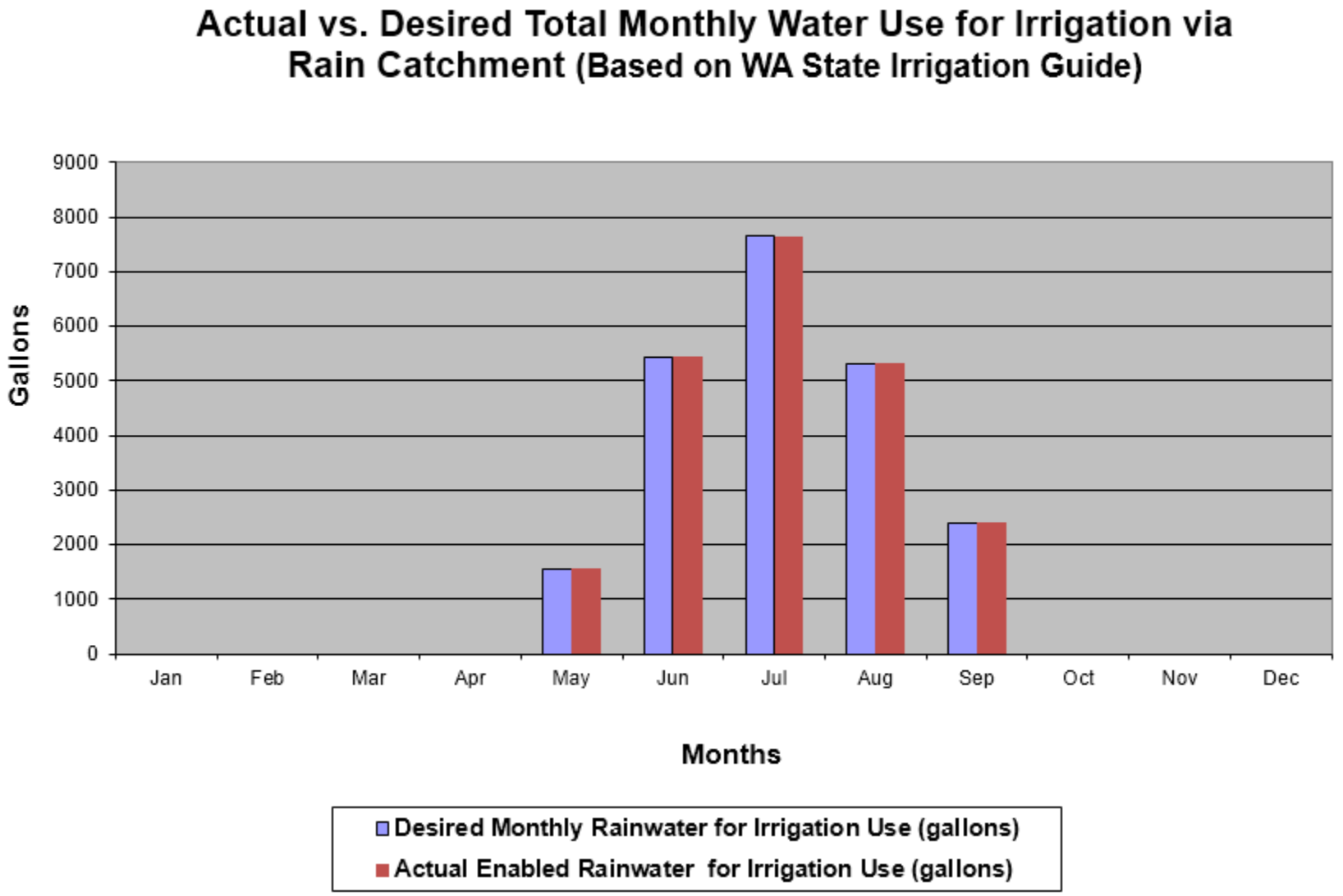


How Much We Use Right Now



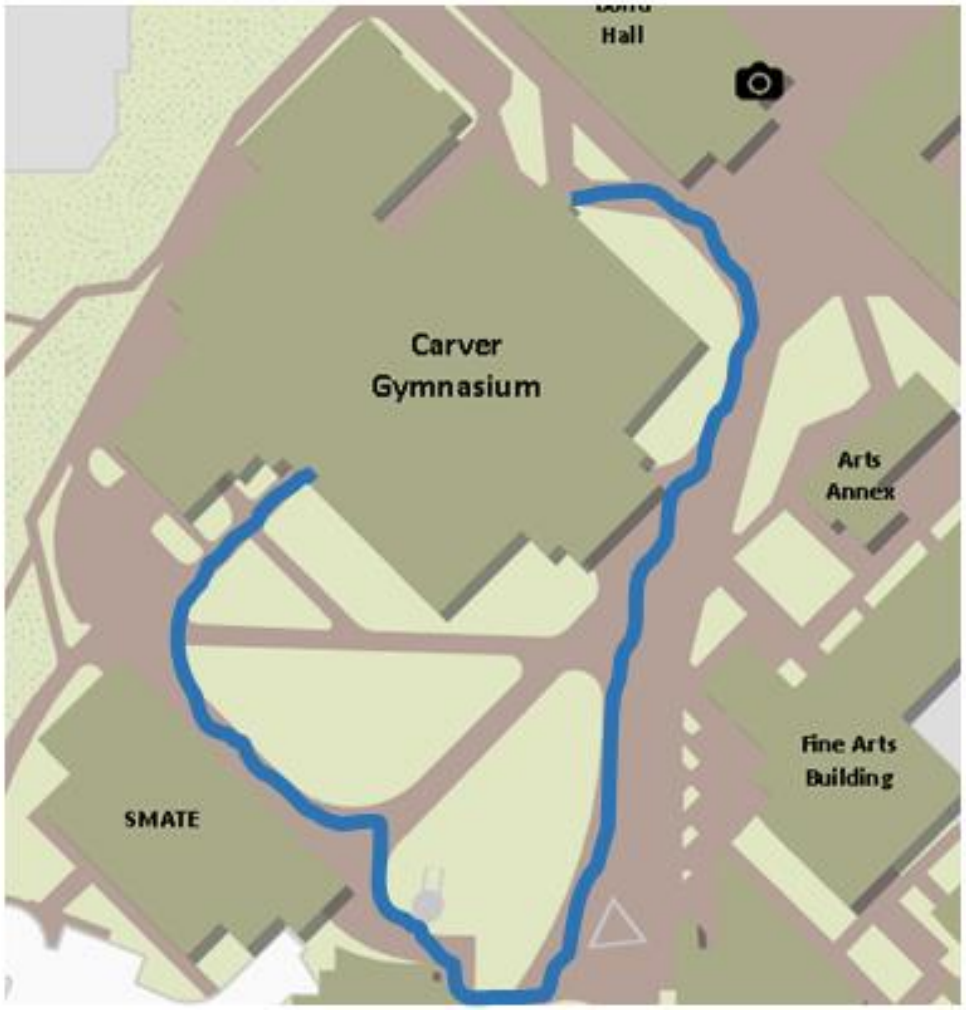
Current Water Usage




Actual vs. Desired Total Monthly Water Use for Irrigation via Rain Catchment (Based on WA State Irrigation Guide)
Gallons
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Months
Desired Monthly Rainwater for Irrigation Use (gallons)
Actual Enabled Rainwater for Irrigation Use (gallons)

Assumed Water Meter Area

Blue Line = Assumed Perimeter for SMATE Water Meter



Budget

Materials	Estimate for One Cistern	Estimate for Two Cisterns
5,100 gallon corrugated metal tank and accessories	$ 9,395	$ 18,790
Passive Filtration System	$ 30	$60
Labor	$4,700	$ 9,395
Total	**$ 14,125**	**$ 28,245**

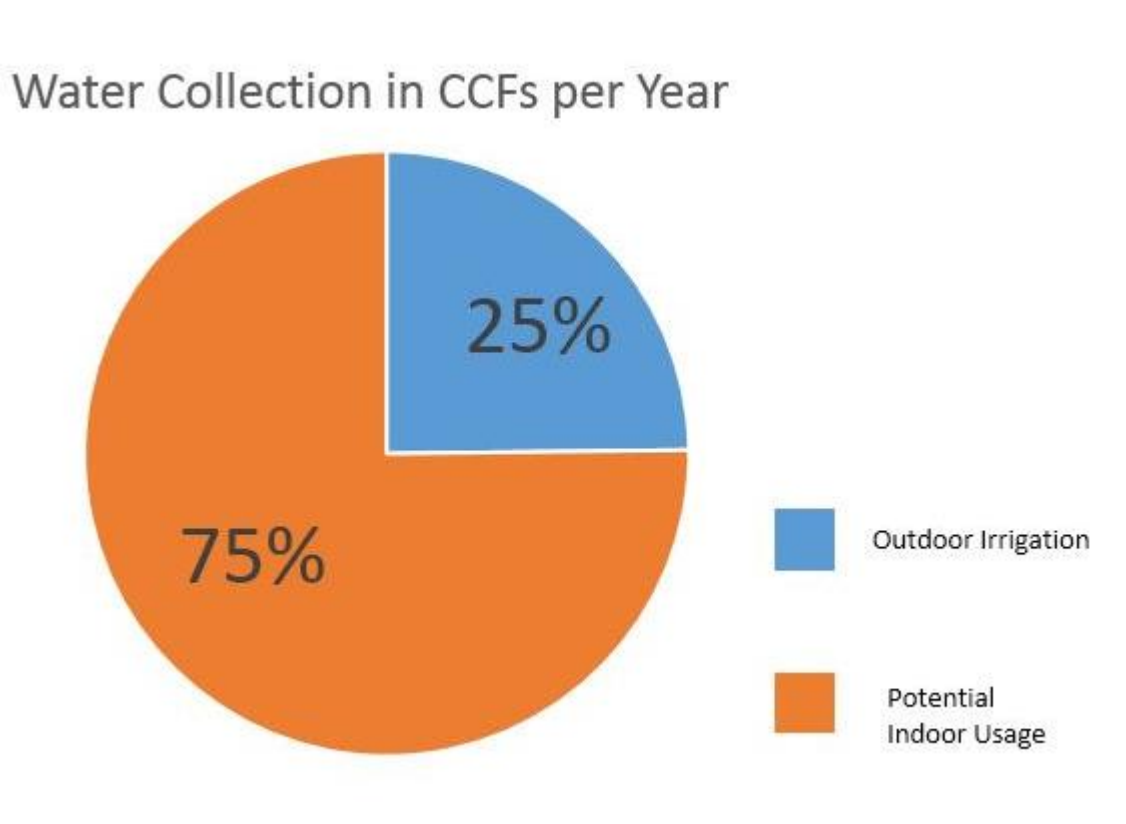
How Much Does All This Cost?

- Western will spend $122,640 over 30 years
- Total savings = $94,455 in 30 years
- Return on Investment = 7 years

Potential Funding

- Green Energy Fee
- State funding for LEED certified remodel

Future Works



- 9,060 ccf collected rainwater left over after irrigation
- Carver Gym uses 450 ccf for toilet flushing per year

Conclusion

- Washington's climate is currently changing
- Rainfall is abundant in Bellingham
- Rain cisterns will save money in the long run
- The time to collect rainwater is now!

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Any Questions?

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